Non sentential coordination with *he/gen/yu/ji/tong* in Mandarin Chinese

AN Aixiu (LLF / University Paris Diderot)

aixiu0806@gmail.com

IACL-24 Beijing

Laboratoire de Linguistique Formelle

Outline

1. Introduction
2. Nominal coordination with ***he/gen/yu/ji/ tong***
3. Coordination of other categories with ***he / gen/yu/ji***
4. Coordination of sequences with ***he/ji***
5. HPSG analysis

1. Introduction

- **Three types of conjunctions in Mandarin (Ma 1994):**
- Type I: with non-sentential elements: *he /gen/yu/ji/tong*

(1) a. Wo he /gen/yu/tong/ji Zhangsan qu xuexiao. "Zhangsan and I go to school."
I and Zhangsan go school.
b. * Wo qu xuexiao he/gen/yu/tong/ji Zhangsan qu xuexiao
* I go school and Zhangsan go school.

- Type II: with phrases (except NP) and sentences: *bingqie*

- (2) a. Tade jifu yuchun bingqie nuoruo. "His stepfather is stupid and weak."
his stepfather stupid and weak.
b. Ta kanqilai jinzhangbuan, bingqie jizhe likai. "He looks like nervous, and anxious to leave"
he look like nervous, and anxious leave.

- Type III: with sentences: *ke (shi)*

- (3) Baoyu yao tiaowu, ke(shi) wo yao hui-jia. "Baoyu wants to dance, but I want to go home."
Baoyu want dance, but I want go-home.

Prepositions or conjunctions?

- Mandarin is classified as a with-language (Stassen 2000).
- *He/gen/yu/tong* can be conjunctions (4) or prepositions (5)
- *Ji* can only be used as conjunction (Zhang 2009).

(4) 我喜欢苹果 和／跟／与／及／同 香蕉。

(5) 张三 和／跟／与／＊及／同 李四吵架。

He /gen/yu/ji/tong

Previous studies:

Lv (1985): register and regional differences:

- *he* - commonly used.
- *gen* - preferred in Beijing dialect
- *tong* - mostly in East China
- *yu* - in written language.
- *ji* - literary register

Coyaud and Paris (1976) : syntactic differences

- *He*/*yu* – with nouns and infrequently with verbs
- *tong*/*gen* - only with nominals

Chen *et al* (1983): syntactic differences

- *Gen*/*tong*/*yu*/ *ji* - nominals only
- *He* - not only nominals, but also adjectives and verbs

2. Nominal coordination with *he /gen/yu/ji/tong*

Nouns can be coordinated by *he/gen/yu/ji/tong* in their three possible functions : argument (6), predicate (7) and adjunct (8)

(6) 校长，老师，和／跟／与／及／同 同学们一起看望了他。

(7) 他是政治家，思想家 和／跟／与／及／同 文学家。

(8) 我们今天 和／跟／与／及／同 明天都休息。

Interpretation of *he/gen/yu/ji/tong*

The conjunctions, for instance *and* in English and *et* in French have two main readings:

=> a propositional or boolean reading (9)

=> a non-propositional or non-boolean reading (10, 11).

(9) John and Mary have blue eyes.

=John has blue eyes and Mary has blue eyes.

(10) John and Mary make a beautiful couple.

≠ John makes a beautiful couple and Mary makes a beautiful couple.

(11) John and Mary earned a total of 50 000 € last year.

≠ John earned a total of 50 000 € last year and Mary earned a total of 50 000 € last year.

Semantics of *he/gen/yu/ji/tong*

– *He/gen/yu/tong* are compatible with distributive predicates (12) and collective predicates: group (13a), sum (13b), or reciprocal (13c)

(12) 张三 和／跟／与／同 李四 都很聪明
＝张三很聪明，李四也很聪明。

(13) a. 张三 和／跟／与／同 李四是一对幸福地夫妻。

b. 张三 和／跟／与／同 李四一共赚了一千欧。

c. 张三 和／跟／与／同 李四是兄弟。

➔ In the nominal domain, he/gen/yu/tong can have both boolean reading and non-boolean reading

Interpretation of *he*/*gen*/*yu*/*ji*/*tong*

– *ji* only has a distributive reading (Zhang 2010):

(14)* 张三及李四是一对幸福的夫妻

(15)* 这家餐馆混合了中式及美式的风格。

=> Only propositional (boolean) reading

3. Coordination of other categories (Not with *tong)*

3.1 Coordination of Adjectives

– Paris (1979) distinguishes scalar adjectives（16）and absolute adjectives（17）.

（16）张三很漂亮。
（17）这个桌子是方的。

– Absolute adjectives may be coordinated by *he/gen/yu/ji in* both predicative (18) and attributive (19) position.

(18)这两个旗子分别是红色的 和／跟／与／及 蓝色的

(19) 广场上挂着红色的 和／跟／与／及 蓝色的旗子。

3.1 Coordination of adjectives

– Scalar adjectives are difficult to coordinate. Most speakers accept attributive ones with *he/yu/ji* (20) but not predicative ones (21)

(20) a. 在黑暗和冰冷的小木屋（cncorpus）

b. 认真与严肃的精神（cncorpus）

c. 高深及新颖的课程 （cncorpus）

(21) ?? 张三很诚实 和／与／及 善良。

Semantics of *he/gen/yu/ji*

- Booelan reading
- "non-boolean" readings are confined to color predicates and material adjectives where the predicate is singular (Lasersohn 1995, Winter 1998)

(22)The flag is green and white = Part of the flag is green and the rest of it is white.
≠ The flag is white and the flag is red.

(23) a glass and chrome table = Part of the table is made of glass and the rest is made of chrome
≠ a glass table and a chrome table

- Not possible in Mandarin

(24) a. * 这个旗子是红色的 和／跟／与／及 蓝色的
b. * 他很喜欢那个金的 和／跟／与／及 陶瓷的戒指。

3.2 Coordination of verbs

- *He*/yu can infrequently coordinate verbs (Coyaud et al. 1976).
- *He* can coordinate verbs, it can be in the position of predicate only when there are some elements before or after it (Chen *et al* 1983) .

(26) 每天早晨，我们必须 [跑] 和 [跳]。（Chen 1983）

(27)会议 [讨论] 和 [决定] 了下季度的生产任务和具体指标。（Chen 1983）

(28)会议 [讨论了] ＊和／并且 [决定了] 下季度的生产任务和具体指标

3.2 Coordination of verbs

⇒ **Hypothesis**: finite/nonfinite contrast in Mandarin clauses (Huang 1982, Li 1989, Lin 2012), *he/yu/ji* can only coordinate non finite verbs.

(29) 他们正在［编辑周恩来选集］和［研究整理恩来同志的生平事迹］(cncorpus)

(30)) 战后英国为［保护其工业］及［维持目前生活标准］，势必施行保护贸易政策。(cncorpus)

(31) [感受] 与［思维］的方式也起了变化。(cncorpus)

3.2 Coordination of verbs

- Test this hypothesis by using modal verbs.
- *The permission modal keyi (be permitted to)* chooses non finite verbs, possibility modal *keneng* (must) selects a finite complement (T.-H. JONAH LIN 2012) .

(32)a. 为了保持身材，你可以 [跳舞] 和／与／及 [跑步]

b. 感冒可能[会导致免疫力下降]＊和／＊与／＊及／并且[会引发其他疾病]。

3.3 Coordination of adverbs

Ernst (2014) distinguishes predicational (manner, degree…) and functional adverbs (aspect, temporal, locative) in Mandarin.

Predicational adverbs must be coordinated by *bingqie* (28), a sentential conjunction.

(33) 他慢慢地 *和／*跟／*与／*及／并且 温柔地说。

Functional adverbs can be coordinated by *he*/gen/*yu*/*ji* (29)

(34) 乌克兰以东以前 和／跟 现在都没有俄罗斯军人

(35) 指标可以指示你目前 及／与 最近可能遭遇的情况。

3.2 Coordination of PPs

– PPs can be coordinated by *he*/*gen*/*yu*/*ji*, as modifiers (36, 37) and complements(38,39)

(36) 你 [在学习上] 和 [在生活上] 都要帮助他。

(37)我 [在家] 跟 [在学校] 都没吃饭。

(38) 集中分析药物 [对其受体] 及 [对平滑肌] 的直接作用。（cncorpus）

(39) 是 [对错误的性质] 与 [对犯错误后会造成怎么样的严重后果] 没有认识而造成的。（cncorpus）

4. Coordination of sequences

Bob gave a record to Mary and a book to Jean.

- Such sequences may involve complements, modifiers, or mix of these two.
- VP coordination with ellipsis (Wilder 1997, Beavers & Sag 2004) (40a) or Argument Cluster Coordination (Maxwell & Manning 1996, Mouret 2006) (40b)

(40) a. Bob [gave a record to Mary] and [~~gave~~ a book to Jean].

b. Bob gave [a record to Mary] and [a book to Jean]

- In English, *as well as* may coordinate two sequences while it is excluded with finite VP or S => there cannot be verbs inside of the second conjunct.（Mouret 2006）

(41) a. Bob gave a record to Mary as well as a book to Jean.

b *Bob gave a record to Mary as well as gave a book to Jean.

4. Coordination of sequences

– In Mandarin, sequences can be coordinated by *he/ji*

(42)1990 年 五月在中国法学基础理论研究会第四次年会和同年十月有关单位在大连召开的民主, 法制, 权利, 义务讨论会上, 与会者对权利和义务的关系问题都进行了热烈的讨论 (cncorpus)

(43) 它的规模将是全省第一大及全国第二大。(sinica corpus)

(44) a. 今年新年, 我买了一条围巾给妈妈和一副手套给爸爸。
b.*今年新年, 我买了一条围巾给妈妈和买了一副手套给爸爸。

=> cannot be elliptical coordination of clauses or finite VPs

5. HPSG analysis

– In a Head-driven Phrase structure grammar (Pollard and Sag 1987, 1994, Sag et al. 2003), words and phrases are organized in a hierarchy of types.

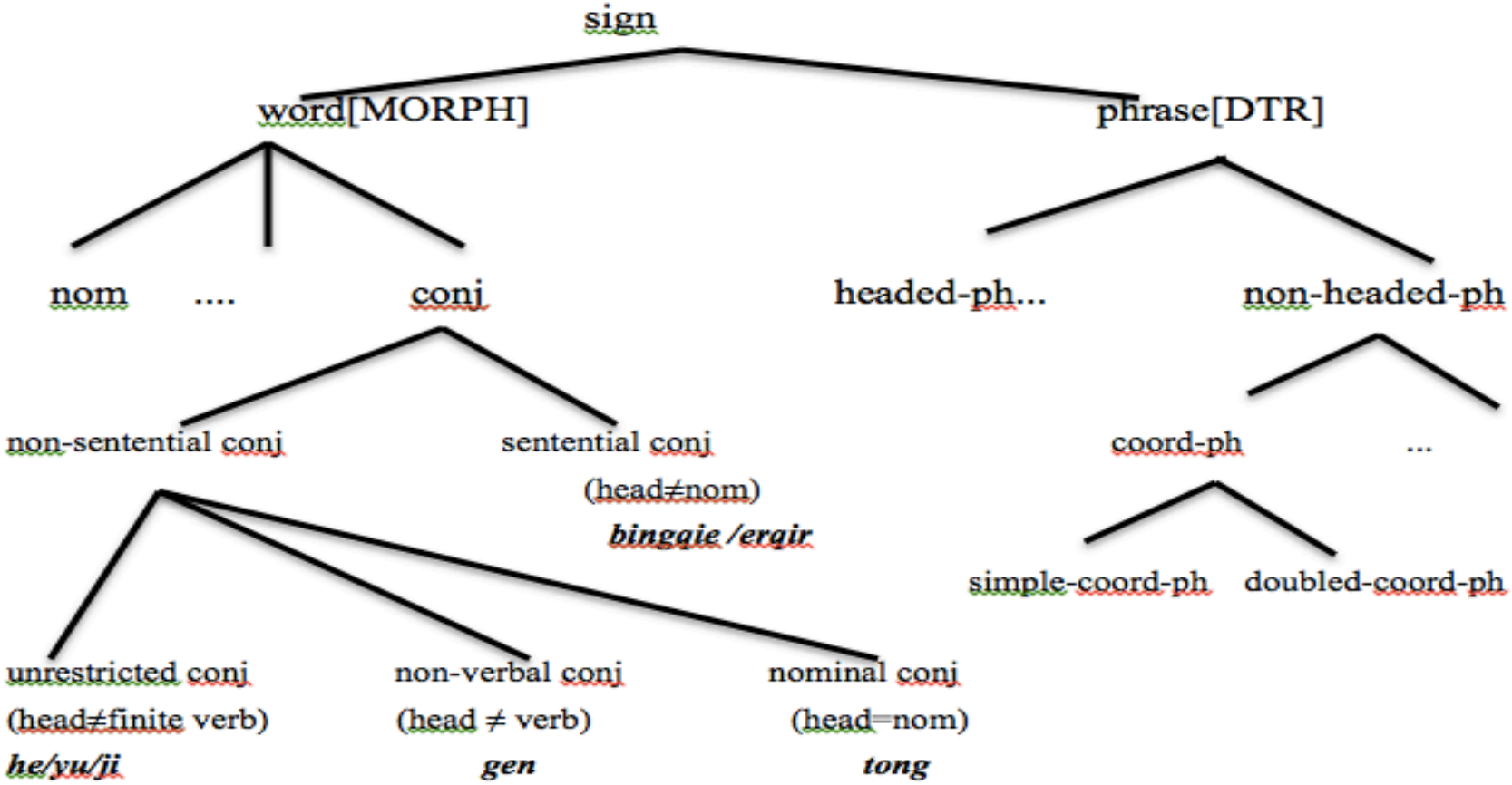

Figure.1 The hierarchy of linguistic signs in HPSG

5.1 HPSG analysis of coordinated phrase

– The coordinated phrase is analyzed as an n-ary unheaded phrase (Sag et al. 2003, Abeillé 2006 and Mouret 2005).

$$\textit{Coord-phrase} \Rightarrow \begin{bmatrix} SYN \begin{bmatrix} CONJ\ nil \\ HEAD\ [1] \\ VALENCE\ [2] \\ SLASH\ [3] \end{bmatrix} \\ SEM\begin{bmatrix} INDEX\ [4] \end{bmatrix} \\ NON-HEAD-DTRS\ ne-list\left(\begin{bmatrix} HEAD\ [1] \\ VALENCE\ [2] \\ SLASH\ [3] \end{bmatrix}\right) + \begin{bmatrix} HEAD\ [1] \\ VALENCE\ [2] \\ SLASH\ [3] \\ INDEX\ [4] \end{bmatrix} \end{bmatrix}$$

5.1 HPSG analysis of coordinated phrase

– In simplex coordinated phrases (*Paul, John and Mary*), a conjunction must appear at least on the last conjunct.

simplxe-coord-phrase => coord-phrase & [*nelist CONJ* nil+*nelist (CONJ≠nil)]*

5.2 HPSG analysis of coordinating conjunctions

– In HPSG, coordinating conjunctions can be analysed as « weak » heads (Abeillé 2005, Mouret 2007), inheriting most of their syntactic features from their complement.

(43) *conj-word* =>

$$\left[SYN \left[\begin{array}{l} CONJ \neq nil \\ HEAD\ [1] \\ VALENCE \left[\begin{array}{l} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS < [SYN \left[\begin{array}{l} HEAD\ [1] \\ VAL \left[\begin{array}{l} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS\ [4] \end{array} \right] \end{array} \right] > +[4] \end{array} \right] \end{array} \right] \right]$$

5.2 HPSG analysis of coordinating conjunctions

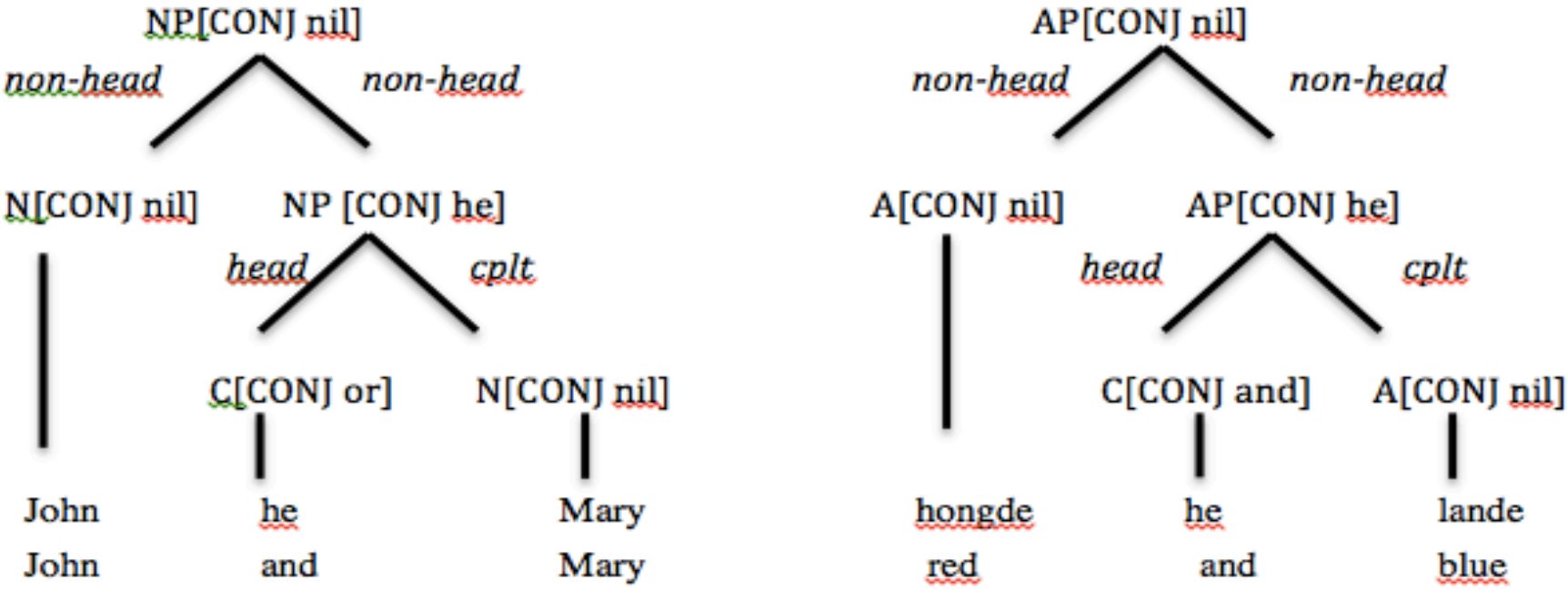

Figure 2. Two coordinated phrases in HPSG

5.2 HPSG analysis of coordinating conjunctions

– Three subtypes conjunction words :

(39) nominal-Conj => conj-word & [HEAD noun]
non-verbal-Conj => conj-word & [HEAD ≠ verb]
unrestricted-Conj => conj-word & [HEAD ≠ verb [finite]]

Analysis of *tong*

tong=> conj-word &

$$\begin{bmatrix} SYN & \begin{bmatrix} CONJ\ tong \\ HEAD\ [1]\ noun \\ VALENCE & \begin{bmatrix} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS < \begin{bmatrix} SYN & \begin{bmatrix} HEAD\ [1] \\ VAL & \begin{bmatrix} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS\ [4] \end{bmatrix} \end{bmatrix} \end{bmatrix} > +[4] \\ SEM\ in \end{bmatrix} \end{bmatrix} \\ SEM\ [INDEX\ k = i1 \oplus \ldots \oplus in] \end{bmatrix}$$

tong=> conj-word &

$$\begin{bmatrix} SYN & \begin{bmatrix} CONJ\ tong \\ HEAD\ [1]\ noun \\ VALENCE & \begin{bmatrix} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS < \begin{bmatrix} SYN & \begin{bmatrix} HEAD\ [1] \\ VAL & \begin{bmatrix} SPEC\ [2] \\ SUBJ\ [3] \\ COMPS\ [4] \end{bmatrix} \end{bmatrix} \end{bmatrix} > +[4] \\ SEM\ j \end{bmatrix} \end{bmatrix} \\ SEM\ [INDEX\ p = p1\ \wedge \ldots \wedge p(j)] \end{bmatrix}$$

Analysis of *tong*

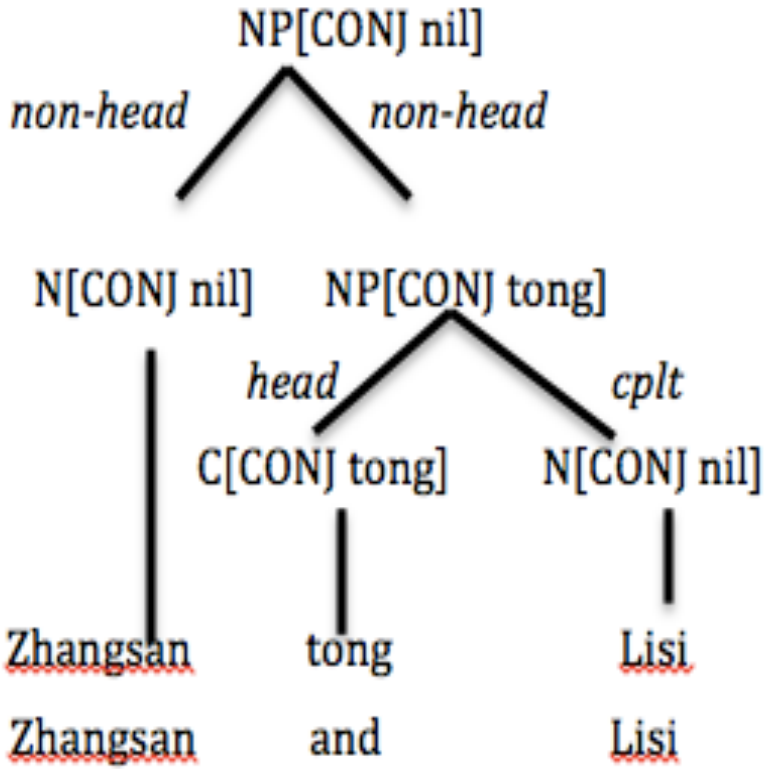

Fig. 3 Simple coordination with *tong*

Analysis of *gen*

gen-1 => nominal conj &

$$\begin{bmatrix} \square \\ SYN \begin{bmatrix} CONJ\ gen \\ VALENCE\ [COMPS\ \langle [INDEX\ in] \rangle \end{bmatrix} \\ SEM\ [INDEX\ k = i1 \oplus \ldots \oplus in] \end{bmatrix}$$

gen-2=> non-verbal conj &

$$\begin{bmatrix} SYN \begin{bmatrix} CONJ\ gen \\ VALENCE\ [COMPS\ \langle \begin{bmatrix} \square \\ SYN\ [TETE \neq verbe\ \square] \\ \square \\ SEM\ [INDEX\ j] \end{bmatrix} \rangle \end{bmatrix} \\ SEM\ [INDEX\ p = p1\ \wedge \ldots \wedge p(j)] \end{bmatrix}$$

Lexical entry for *he/yu/ji*

$$\text{he-1} \Rightarrow \text{nominal conj} \;\&\; \begin{bmatrix} SYN \begin{bmatrix} CONJ\ he \\ VALENCE\ [COMPS\ \langle [SEM\ [INDEX\ in]] \rangle \end{bmatrix} \\ SEM\ [INDEX\ k = i1 \oplus \ldots \oplus in] \end{bmatrix}$$

$$\text{he-2} \Rightarrow \text{unrestricted conj} \;\&\; \begin{bmatrix} SYN \begin{bmatrix} CONJ\ he \\ VALENCE\ [COMPS \langle [SEM [INDEX\ j]] \rangle \end{bmatrix} \\ SEM\ [INDEX\ p = p1\ \wedge \ldots \wedge p(j)] \end{bmatrix}$$

Lexical entry for *he/yu/ji*

ji=> unrestricted conj &

$$\begin{bmatrix} SYN & \begin{bmatrix} CONJ\ ji \\ VALENCE\ [COMPS\ \langle \boxed{\ } \rangle] \end{bmatrix} \\ & SEM\ [INDEX\ p = p1\ \wedge \ldots \wedge p(j)] \end{bmatrix}$$

$$\boxed{\ } = \begin{bmatrix} SEM\ [INDEX\ j] \end{bmatrix}$$

Conclusions

- Syntactic distinctions between ***he /gen/yu/ji/tong:***

all coordinate nouns, not clauses nor finite VP

he/gen/yu/ji may coordinate adjectives, PPs, functional adverbs and non finite verbs

he/ji may coordinate sequences

– Semantic distinctions between ***he /gen/yu/ji/tong:***

he/gen/yu/tong compatible with boolean and non boolean reading

ji only compatible with distributional (boolean) reading

– HPSG well suited for capturing these differences